Indianapolis *Gregory A. Ballard, Mayor*
REBUILDINDY
Department of Public Works

VEGETATION AND ENCROACHMENT MANAGEMENT FOR LEVEES AND FLOODWALLS

LEVEE MAINTENANCE:

Levees play an integral role in providing public safety and flood protection. When working properly, levees protect communities during times of high water. When levees fail, they fail catastrophically, as experienced during Hurricane Katrina in 2005.

Though levees are built to provide long-term protection from flooding, they require regular maintenance and periodic upgrades to ensure they continue to function properly.

As part of its on-going Levee Certification Program to attain accreditation by the Federal Emergency Management Agency (FEMA), the City of Indianapolis is using a set of specifications developed by the U.S. Army Corps of Engineers (USACE) for the rehabilitation and inspection of levees. The USACE specifications are to ensure proper maintenance and function of levee systems. A primary component of the specifications considers the potential effects of trees and vegetation growing on or too close to a levee.

As determined by the USACE, removing and preventing tree growth is a critical aspect of levee maintenance. Trees and their roots growing on or too close to the levee can affect the stability of the structure or cause direct damage. Roots can create pathways for water to seep through and weaken the levee, especially near a floodwall. A fallen tree could also cause failure of the levee slope and damage to floodwalls.

USACE specifications require that all trees 2 inches in diameter or greater and the attached roots be removed within 15 feet of the levee toe, or the bottom portion of the levee. Once removed, the area should be backfilled with impervious material and reseeded with grass and sod.

Grass and sod play an important role in levee protection by preventing erosion. Mowing also is essential, as long grasses can prevent proper inspection, make repair difficult and hide potential hazards, such as cracks.

Any compromise to the integrity of a levee can potentially lead to failure. By following the recognized federal criteria, the City can ensure that Indianapolis property owners and residents should continue to receive accredited flood protection.

FLOODWALLS:

Floodwalls are most often used in urban areas, where land or access is constrained. These walls are subject to hydraulic forces on one side, which may be resisted by little or no earth-loading forces on the other side.

Large trees planted near a floodwall can be a threat. Planting design and maintenance must take into account the potential for overturning trees to damage floodwalls. In an effort to limit the potential for such damage, a minimum distance must be maintained between a tree and the wall; trees must be monitored and maintained to avoid hazards. In addition, intervening obstacles, such as other trees, that would reliably restrain a falling tree can serve as preventions to damage.

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There are also three potential means by which tree roots may damage floodwalls:

- Large tree roots can damage concrete structures by jacking (lifting) them, which can cause cracking and separation joints.
- Roots may also grow into and through wall joints, loosening and eroding wall-joint seals, thus damaging the water-proof characteristics.
- A floodwall may have a toe drainage system to check and control piping and boils; to control seepage that may result from roofing, where piles are used; and to control uplift pressures. These drainage systems must be protected from invasion by roots, which could clog them.

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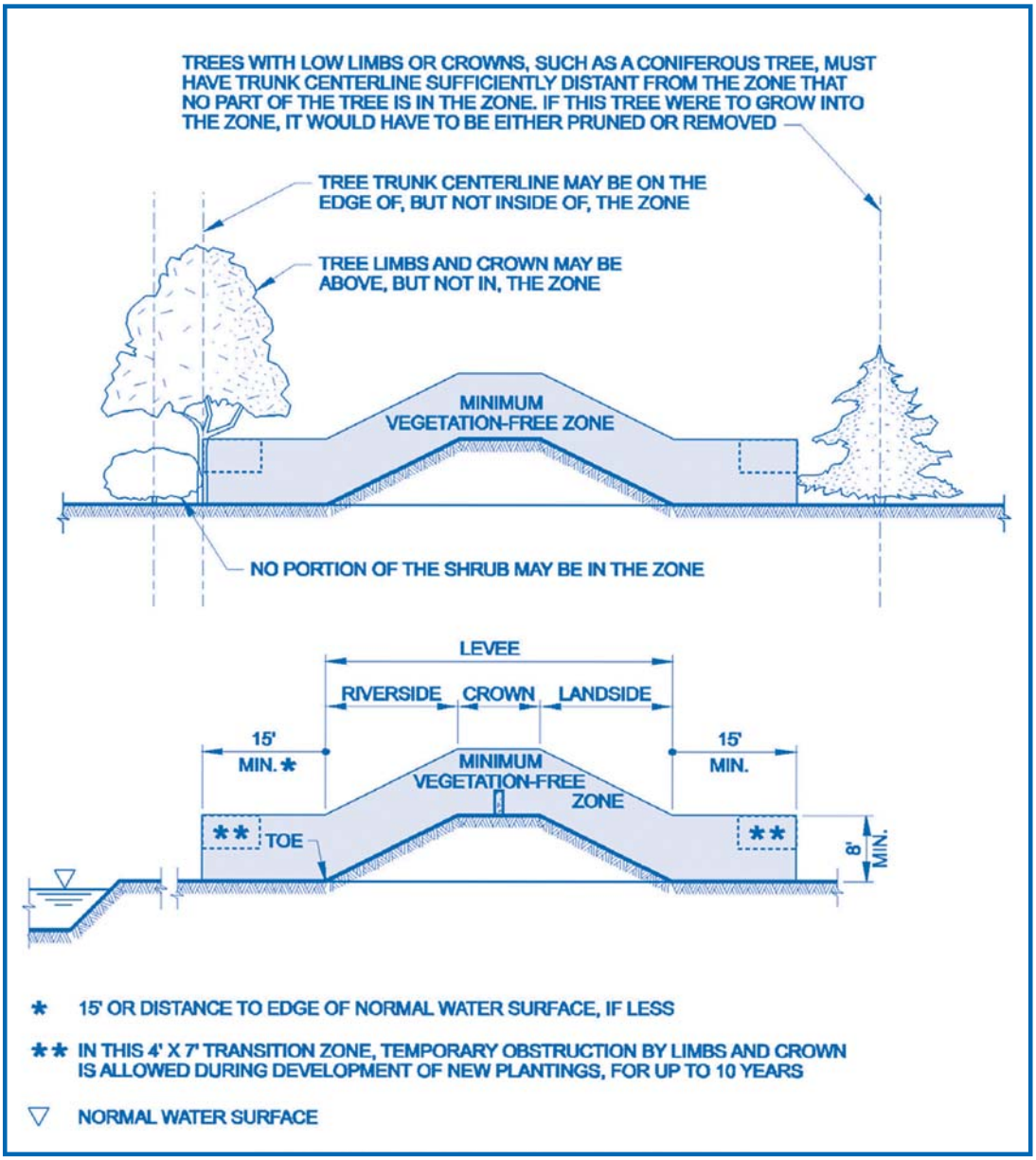

NOTE: No fences or other private structures permitted.

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VEGETATION-FREE ZONE:

A vegetation-free zone is a three-dimensional corridor surrounding all levees, floodwalls, embankment dams and critical appurtenant structures in all flood damage reduction systems. The vegetation-free zone applies to all vegetation except grass. Grass species are permitted for the purpose of erosion control. The only acceptable vegetative ground cover in the vegetation-free zone shall be perennial grasses. Their primary function shall be to reliably protect against erosion. They shall be maintained as necessary to ensure the health and vigor of the primary species providing erosion protection. Grass must be able to tolerate mowing to heights as low as 3 inches at least once each year for inspection; anticipation of flood conditions and associated monitoring and flood-fighting activities.

The primary purpose of the vegetation-free zone is to provide a reliable corridor of access to and along levees, floodwalls, embankment dams and appurtenant structures. This corridor must be free of obstructions to assure adequate access by personnel and equipment for surveillance, inspection, maintenance, monitoring and flood-fighting. This access requires areas free of fences and other structures. Accessibility is essential to the reliability of flood damage reduction systems.

The vegetation-free zones must also be wide enough and tall enough to accommodate all likely access requirements. The minimum height of the corridor must be 8 feet, measured vertically from any point on the ground. The minimum width of the corridor will be the width of the levee or floodwall, including all critical appurtenant structures, plus 15 feet on each side, measured from the outer edge of the outermost critical structure.

LANDSCAPE PLANTING:

In flood damage reduction projects, the goal of landscape planting is to minimize and/or mitigate negative impacts to environmental and ecological conditions, such that post-project conditions are equal to or better than pre-project conditions.